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INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 3FPO-07-05	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/KR2003/001820	International filing date (day/month/year) 04 SEPTEMBER 2003 (04.09.2003)	Priority date (day/month/year) 13 SEPTEMBER 2002 (13.09.2002)
International Patent Classification (IPC) or national classification and IPC IPC7 C12Q 1/68		
Applicant KOREA RESEARCH INSTITUTE OF BIOSCIENCE AND BIOTECHNOLOGY et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the report
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 19 JANUARY 2004 (19.01.2004)	Date of completion of this report 26 JANUARY 2005 (26.01.2005)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer BAIK, Kyong UP Telephone No. 82-42-481-5596 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/001820

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement) under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.
- ☒ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed," and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR2003/001820

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-33	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-33	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-33	YES
	Claims	NONE	NO

2. Citations and explanations (Rule 70.7)

Claims 1-9 of the present invention relate to a method for screening a mutant lipase having an improved enzymatic activity comprising (1) cloning a lipase gene into a surface display vector; (2) preparing a mutant lipase gene library by mutagenic PCR using the lipase gene in the surface display vector; (3) displaying the mutant lipase gene in the surface of cells by transforming the mutant lipase gene library of the step 2 and surface display vector fragment into host cells; (4) measuring the activity of the mutant lipase displayed in the surface of the transformed host cells and selecting the lipase showing evolved activity. Claims 10-26 relate to mutant lipase protein, a gene and an expression vector characterized in that #219 leucine and/or #278 leucine of *Candida antarctica* lipase B represented by SEQ. ID. No 14 is replaced by other amino acids. Claims 27-33 relate to a transformant in which the expression vector of claim 20 is introduced to host cells.

1. Novelty

The method for screening a mutant lipase of claims 1-9, mutant lipase protein, a gene and an expression vector of claims 10-26, and a transformant in which the expression vector of claim 20 is introduced to host cells of claims 27-33 are novel compared with the prior art documents cited in ISR [PCT Article 33(2)].

2. Inventive Step

The method for screening a mutant lipase of claims 1-9, mutant lipase protein, a gene and an expression vector of claims 10-26, and a transformant in which the expression vector of claim 20 is introduced to host cells of claims 27-33 are considered inventive since those inventions cannot be easily invented by a person skilled in the art from the prior art [PCT Article 33(3)].

3. Industrial Applicability

Claims 1-33 of the present invention are considered industrially applicable [PCT Article 33(4)].